

REMARKS

The Examiner's Action mailed on May 25, 2005, has been received and its contents carefully considered. Reconsideration of the final rejections presented therein is requested for at least the following reasons.

The Examiner has rejected all of the pending claims as being obvious over *Kim* (USP 5,807,784) in view of *Prabhakar* (USP 5,896,359). It is submitted that these claims are *prima facie* patentably distinguishable over the cited combination of references, either taken alone or in any reasonable combination, for at least the following reasons.

Applicant's independent claim 1 recites a method of making a semiconductor device which includes, *inter alia*, implanting oxygen ions through a pad oxide film and into selected parts of a silicon layer, and then oxidizing the selected parts of the silicon layer, into which the oxygen ions have been implanted, and while the selected parts are still covered by the pad oxide film, to form isolation regions. Independent claims 8 and 20 recite similar features. This claimed method mitigates the problems of lateral bird's beak elongation of the field oxide films which isolate active elements, and abrupt vertical steps between the active element regions and field oxide regions, and is particularly advantageous when utilized with a fully depleted silicon-on-insulator device.

In contrast, *Kim* discloses a device isolation method in which a semiconductor 30 is covered with a pad oxide layer 32, an oxidation blocking layer 34, and a photosensitive layer 36. Using the photosensitive layer 36 as a mask,

the oxidation blocking layer 34 and the pad oxide layer 32 are etched, thereby exposing portions of the semiconductor substrate, as shown in figure 4A.

Thereafter, oxygen ions are implanted into the exposed portions of the semiconductor substrate, as shown in figure 4B, to form oxygen implanted layers

37. Next, the semiconductor substrate is subjected to thermal oxidation to form field oxide layer 38, as shown in figure 4C.

However, and in contrast to the present invention, this reference does not disclose or suggest implanting oxygen ions through the pad oxide film 34, as required by Applicant's independent claims. Instead, the portions of the semiconductor 30 which have the oxygen ions implanted therein is completely exposed, due to the removal of the oxidation blocking layer 34 and pad oxide layer 32. Moreover, during the oxidation process disclosed by this reference, the parts of the silicon layer into which the oxygen ions have been implanted are not covered by the pad oxide layer 32, which is in contrast to the recitation required by Applicant's independent claims 1, 8 and 20. As noted above, the pad oxide layer 32 has been removed from over the oxygen implanted layer 37.

As a side note, it is noted that *Kim* shows in figure 1A implanting ions through a pad oxide layer 3 to form a channel stopper 7. However, these ions, which are described as impurities (see column 1, lines 62 and 63) are not oxygen ions, because they do not react with the semiconductor silicon material during the oxidation process. Instead, they are redistributed during the oxidation process to form a channel stopper region 15 (see figure 1B, and column 1, lines 62-64) which

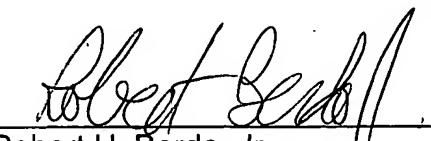
is disposed beneath the field oxide 13. Furthermore, the secondary reference to *Prabhakar* does not discuss anything about the formation of a field oxide, except that the field oxide regions 18 are preferably formed using a suitable local oxidation of silicon technique, as discussed in column 2, lines 42-44. As such, this reference does not overcome the above-noted deficiencies of *Kim*. Therefore, it is submitted that Applicant's independent claims 1, 8 and 20 are *prima facie* patentably distinguishable over the cited combination of references, and it is thus requested that these claims be allowed and that these rejections be withdrawn.

It is submitted that this application is in condition for allowance. Such action and the passing of this case to issue are requested.

Should the Examiner feel that a conference would help to expedite the prosecution of this application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Should any fee be required, the Commissioner is hereby authorized to charge the fee to our Deposit Account No. 18-0002, and advise us accordingly.

Respectfully submitted,



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Date

RHB:vm

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